

# High Frequency Ceramic Solutions

868/915MHz Impedance Matched, Multi-Function, Integrated Ceramic Passive Component for Texas Instruments CC112x, CC117x & CC12xx Chipsets

P/N 0900PC15J0013

Detail Specification: 9/17/2013

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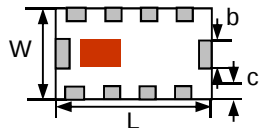
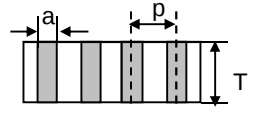
## General Specifications

|                                |                                             |
|--------------------------------|---------------------------------------------|
| Operating Temperature          | -40 to +85°C                                |
| Reel Quantity                  | 4,000                                       |
| Recommended Storage Conditions | +5 ~ +35°C, Humidity: 45~75%RH, 18 mos. Max |

## RF Specifications

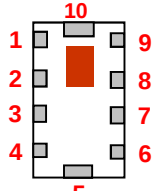
|         |                    |          |                        |
|---------|--------------------|----------|------------------------|
| Tx Mode | Oper. Frequency    | TX-ANT   | 868 ~ 928MHz           |
|         | Insertion Loss     |          | 2.0 dB max.            |
|         | Attenuation (min.) |          | 35.0 min. @ 2 × fo MHz |
|         | Attenuation (min.) |          | 35.0 min. @ 3 × fo MHz |
|         | Attenuation (min.) |          | 35.0 min. @ 4 × fo MHz |
|         | Attenuation (min.) |          | 35.0 min. @ 5 × fo MHz |
| Rx Mode | Return Loss        | TX & ANT | 9.5 dB min.            |
|         | Oper. Frequency    | RX-ANT   | 868~928 MHz            |
|         | Insertion Loss     |          | 2.5 dB max.            |
|         | Phase Diff. (deg)  |          | 180±15                 |
|         | Amp. Diff.         |          | 2.0 dB max.            |
|         | Return Loss        | RX & ANT | 9.5 dB min.            |

## Mechanical Dimensions

|                                                                                    |                   |                                                                                     |  |
|------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------|--|
|  |                   |  |  |
|                                                                                    | In                | mm                                                                                  |  |
| L                                                                                  | 0.079 ± 0.008     | 2.00 ± 0.20                                                                         |  |
| W                                                                                  | 0.049 ± 0.008     | 1.25 ± 0.20                                                                         |  |
| T                                                                                  | 0.039 max.        | 1.0 max.                                                                            |  |
| a                                                                                  | 0.010 ± 0.004     | 0.25 ± 0.10                                                                         |  |
| b                                                                                  | 0.012 ± 0.006     | 0.30 ± 0.15                                                                         |  |
| c                                                                                  | 0.008 +.004/-.006 | 0.20 +0.1/-0.15                                                                     |  |
| p                                                                                  | 0.020 ± 0.004     | 0.50 ± 0.10                                                                         |  |

## Terminal Configuration for CC12XX and CC112X

| No. | Function |        |
|-----|----------|--------|
| 1   | LNA_N    | 6 GND  |
| 2   | LNA_P    | 7 ANT  |
| 3   | TRX      | 8 GND  |
| 4   | PA       | 9 GND  |
| 5   | GND      | 10 GND |



## Part Number Explanation

|                   |                 |                        |                          |
|-------------------|-----------------|------------------------|--------------------------|
| Packing Style     | Bulk            | Suffix = S             | Eg. 0900PC15J0013S       |
|                   | T & R           | Suffix = E             | Eg. 0900PC15J0013E       |
| Termination style | T & R (Reverse) | Suffix = R             | Eg. 0900PC15J0013R       |
|                   | 100% Tin        | Suffix = None          | Eg. 0900PC15J0013(E/R/S) |
|                   | Tin / Lead      | Please Consult Factory |                          |

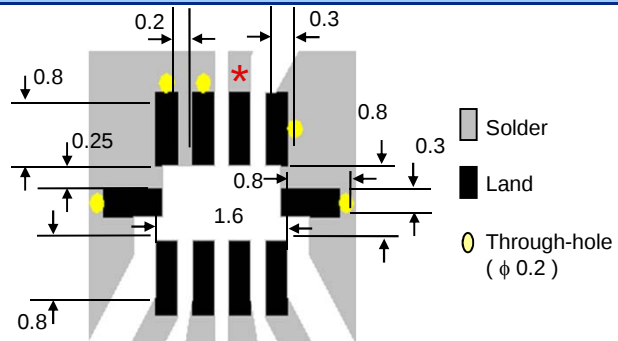
Go to page 5 for more details

## Mounting Considerations

\* Line width should be designed to provide 50 ohm impedance, depending on PCB material and thickness

Gerbers links available for download on [page 20](#) of CC112x, CC117x & CC12xx Design Note DN039: [www.johansontechnology.com/images/stories/ip/hipc/swra407.pdf](http://www.johansontechnology.com/images/stories/ip/hipc/swra407.pdf)

Units: mm



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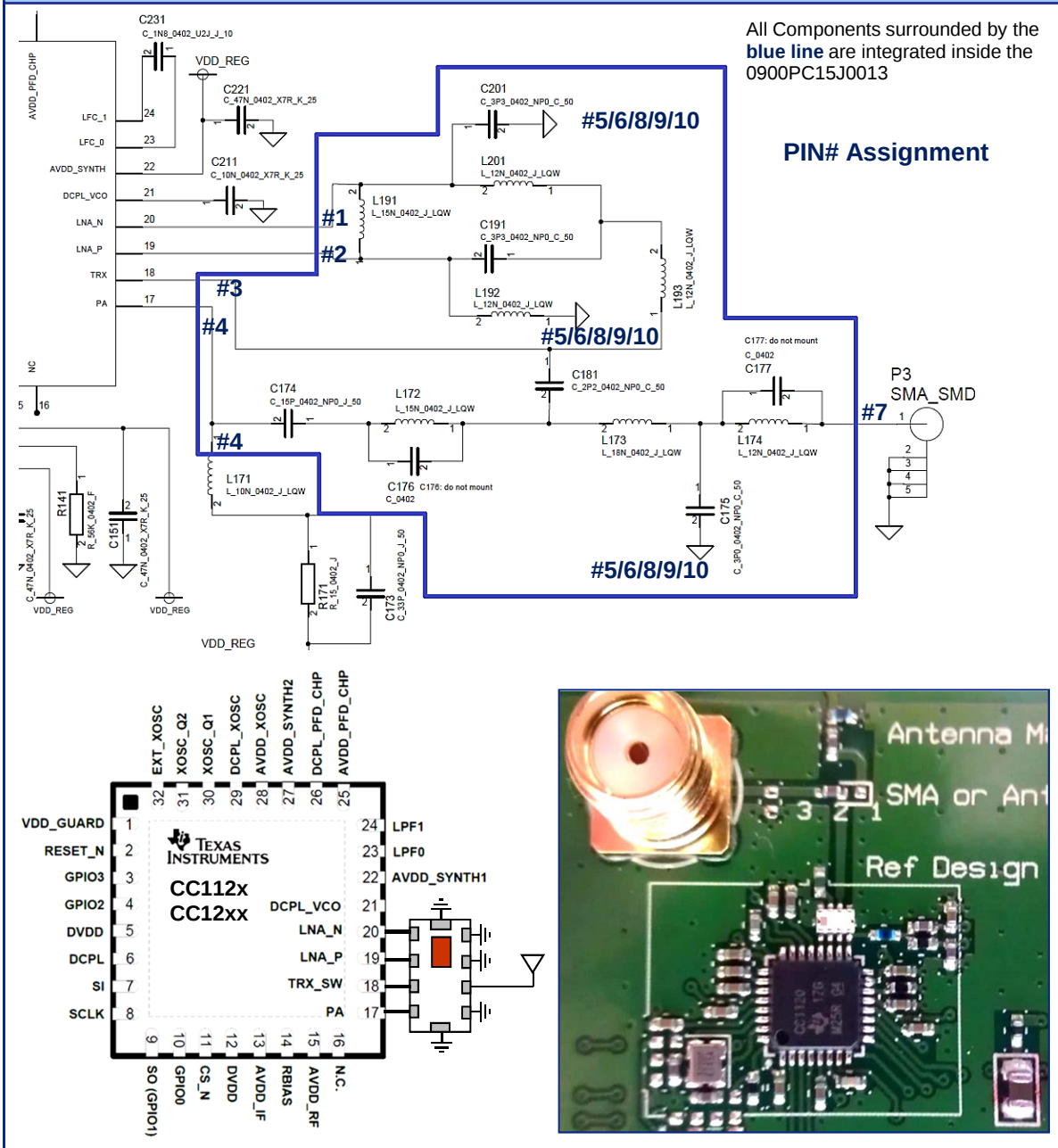
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## Circuit Schematic and Application



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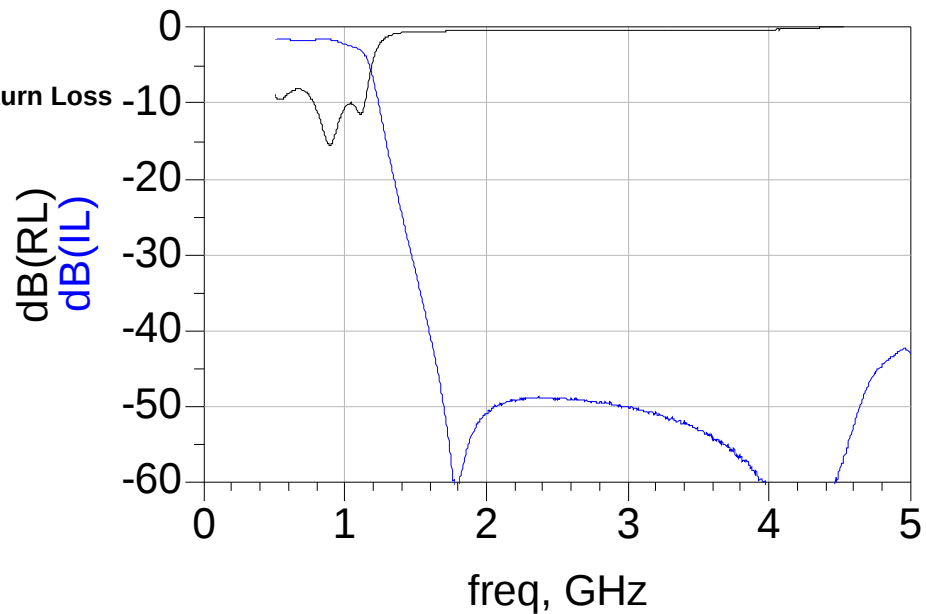
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## Typical Electrical Performance (T=25°C)

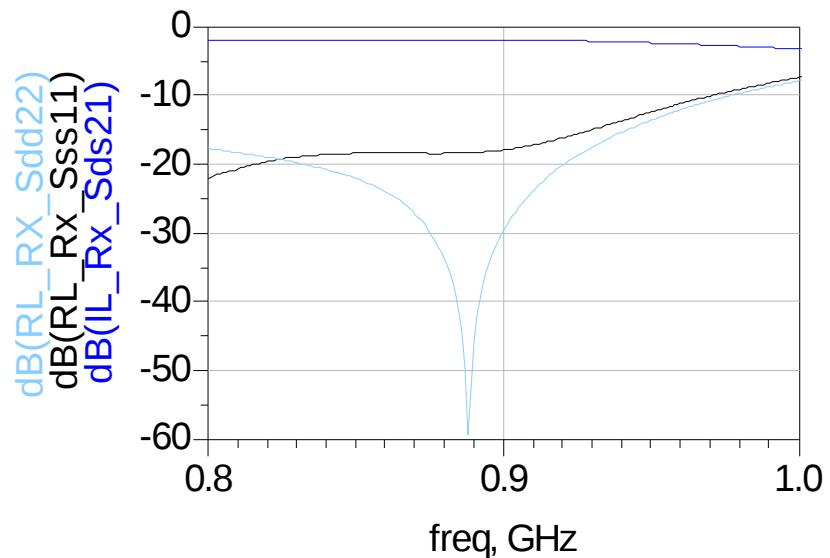
TX mode:

Insertion & Return Loss



RX mode:

Insertion & Return Loss



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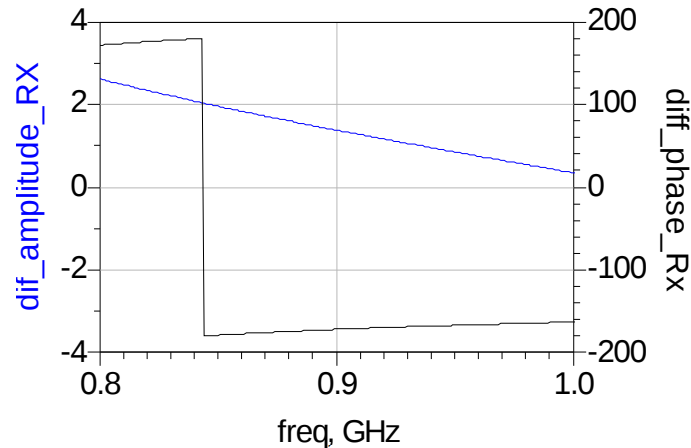
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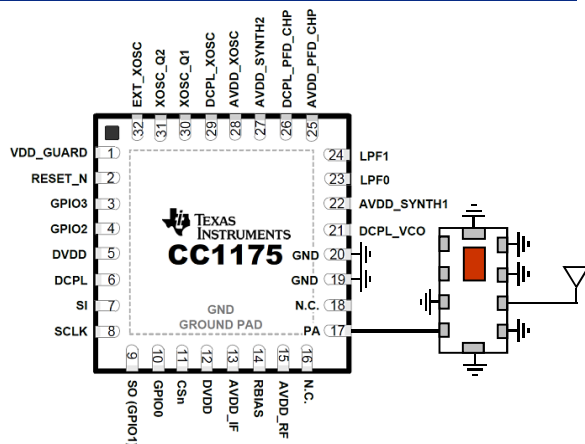
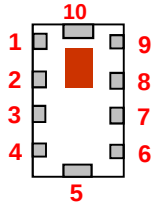
## Typical Electrical Performance (T=25°C)

Amplitude & Phase Balance



## Terminal Configuration for CC1175

| No. | Function  |    |     |
|-----|-----------|----|-----|
| 1   | NC or GND | 6  | GND |
| 2   | NC or GND | 7  | ANT |
| 3   | GND       | 8  | GND |
| 4   | PA        | 9  | GND |
| 5   | GND       | 10 | GND |



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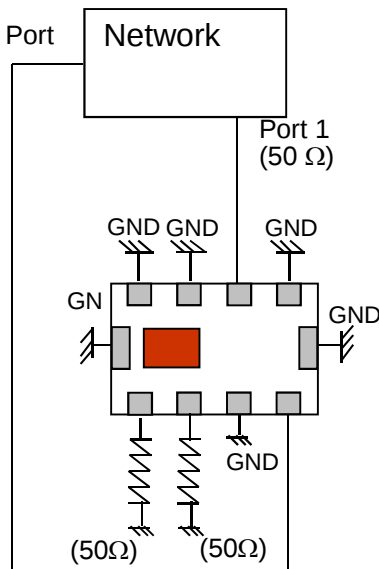
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## Measuring Diagram



Tx :

Port1: Antenna Port

Port1 Terminate impedance: 50ohm

Port2: PA Port

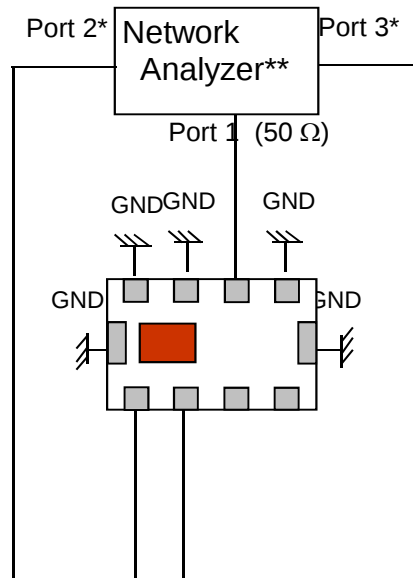
Port2 Terminate impedance:

Complex conjugate to impedance of TI CC112X PA pin

$IL = S_{21}$

$RL = S_{11} / S_{22}$

\*\*E5071B / C from Agilent



RX:

Port 1: Antenna Port

Port1 Terminate impedance: 50ohm

Ports 2 and 3: Rx Balanced Port

\*Port 2 and 3 Terminate impedance : Complex conjugate to  $1/2 \times$  (Balance impedance of TI CC112X LNA\_N / LNA\_P pins)

$IL = S_{ds21}$

$RL = S_{ss11} / S_{dd22}$

$Amp\_balance = dB(S(3,1)/S(2,1))$

$Phase\_balance = Phase(S(3,1)/S(2,1))$

## Packaging information

[www.johansontechnology.com/ipcpackaging.html](http://www.johansontechnology.com/ipcpackaging.html)

## Soldering Information

[www.johansontechnology.com/ipcsoldering-profile](http://www.johansontechnology.com/ipcsoldering-profile)

## RoHS Compliance

[www.johansontechnology.com/technical-notes/rohs-compliance.html](http://www.johansontechnology.com/technical-notes/rohs-compliance.html)

## MSL Info

[www.johansontechnology.com/technical-notes/msl-rating.html](http://www.johansontechnology.com/technical-notes/msl-rating.html)

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